

ATTACHMENT 2

RCRA Facility Investigation/Corrective Measures Study Scope of Work

I. Objective:

The objective of the RFI/CMS is to conduct studies to evaluate the nature and extent of releases of Contaminants at and from the Facility and Additional Areas; to evaluate characteristics of the Facility and Additional Areas; to gather data necessary to support an assessment of risk to human health and the environment posed by such releases; and, as appropriate, to identify, develop, evaluate, and recommend corrective measures alternatives to protect human health and the environment. AK Steel shall complete the following steps in the RCRA Corrective Action Program during the conduct of the RFI/CMS:

1. Characterize the nature and extent of Contamination both within and migrating beyond the boundaries of the Facility and Additional Areas. This includes defining the pathways and methods of migration of the Contamination, including the media affected, the extent, direction, and rate of migration of the Contaminants, complicating factors influencing Contaminant movement, concentration profiles, etc.;
2. Locate the source(s) of release(s) of Contaminants (e.g., Hazardous Waste Management Units (HWMUs), Solid Waste Management Units (SWMUs), Areas of Concern (AOCs), spill areas, and other suspected source areas);
3. Identify areas and populations that may be adversely affected by releases of Contaminants from the Facility and Additional Areas;
4. Determine actual and potential threats to human health and/or the environment in both the short and long term resulting from releases of Contaminants from the Facility and Additional Areas;
5. Evaluate the overall integrity of existing containment structures and activities at the Facility and Additional Areas intended for long-term containment; and
6. Identify, develop, and evaluate corrective measures alternatives to prevent and remediate releases of Contaminants from the Facility and Additional Areas, including measures to monitor the maintenance and performance of any corrective measures, Interim Measures and stabilization measures.

The RFI/CMS shall be conducted in a manner consistent with EPA's "Interim Final RCRA Facility Investigation (RFI) Guidance," Volumes I through IV, OSWER Directive 9502.00-6D, EPA 530/SW-89-031, May, 1989, (RFI Guidance), and other applicable guidance, including guidance identified in this SOW and Attachment 4 to the Consent Decree. AK Steel shall implement the RFI/CMS in accordance with the requirements of the Consent Decree, this RFI/CMS SOW, the approved RFI/CMS Workplan, any applicable requirements of federal and state statutes or regulations, and all plans approved by EPA pursuant to the Consent Decree. AK Steel shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RFI/CMS. For purposes of implementing the RFI/CMS required pursuant to this SOW, including any risk assessment and any evaluation of corrective measure alternatives, AK Steel may assume that the current and anticipated land use of the AK Steel property (but not

including any portions of Dicks Creek and Monroe Ditch) is “commercial/industrial” provided that: (i) concurrently with submission of any RFI Report or risk assessment that incorporates such an assumption, AK Steel also submits for approval in accordance with Section IX of the Consent Decree draft environmental covenants in accordance with R.C. §§ 5301.80 through 5301.92, enforceable by Plaintiffs, that prohibit other uses of the property in the future, and (ii) as a condition of approval of any such RFI Report or risk assessment, AK Steel shall execute and record the approved environmental covenant. Nothing in this SOW shall be construed to preclude AK Steel from including natural or engineered barriers, or institutional controls consistent with “Use of Institutional Controls in the RCRA Corrective Action Program,” USEPA Region 5, March 2000, as components of any corrective action alternative evaluated or recommended during any CMS implemented pursuant to this SOW; nor shall this SOW be construed to preclude EPA from selecting any corrective measure alternative that includes institutional controls, natural barriers or engineered barriers.

II. RFI/CMS Components

This RFI/CMS includes the following components which are discussed in more detail below. References to specific HWMUs, SWMUs, AOCs, spill areas, and other suspected source areas are by number as identified in Exhibit A to this SOW and/or as depicted in Exhibits B and C to this SOW.

Part 1: Current Conditions Report

- A. Facility Background
- B. Preliminary Assessment of Nature and Extent of Contamination
- C. Preliminary Site Conceptual Model
- D. Description of Interim/Stabilization Measures

Part 2: Project Management Plan

Part 3: RFI/CMS Workplans

- A. Purpose/Objectives
- B. Project Management Plan
- C. Data Collection Quality Assurance Project Plan (QAPP)

- D. Detailed Description of the Tasks to be Performed
- E. Data Management and Reporting
- F. Public Involvement
- G. Schedule for RFI/CMS

Part 4: Health and Safety Plan

Part 5: Facility Investigation

- A. Purpose/Objectives
- B. Environmental Setting
- C. Source Characterization
- D. Contamination Characterization
- E. Potential Receptor Identification
- F. Risk Assessment Assumptions Report

Part 6: Investigation Results and Analysis - RFI Report

- A. Data Analysis
- B. Analysis of Risk
- C. Corrective Measures Objectives

Part 7: Alternatives Summary Report and Corrective Measures Study Report

- A. Introduction/Purpose
- B. Description of Current Conditions
- C. Corrective Measures Objectives
- D. Identification, Screening and Development of Corrective Measure Alternatives - Alternatives Summary Report

- E. Evaluation of Corrective Measure Alternatives - Corrective Measures Study Report
- F. Recommendation by AK Steel for a Final Corrective Measure Alternative
- G. Public Involvement

Part 8: Progress Reporting

Part 9: Schedule

Part 1: Current Conditions Report

AK Steel shall submit for review and approval in accordance with Section IX of the Consent Decree a Current Conditions Report (CCR) as set forth below. The CCR shall provide background information on the Facility, including each of the areas identified in Exhibit A and/or depicted in Exhibits B and C to this SOW, the Contaminants and potentially affected media associated with each area, and any Interim Measures implemented to date. The CCR is not required to include detailed information regarding the Interim Measures required pursuant to Attachment 1 to the Consent Decree; however, such Interim Measures shall be depicted on maps of the Facility and Additional Areas in the CCR. AK Steel shall submit the CCR in accordance with the schedule in Part 9 of this SOW.

The objective of the CCR is to evaluate existing data to:

- Screen HWMUs, SWMUs, AOCs, spill areas, and other suspected source areas at the Facility and Additional Areas from inclusion in the RFI/CMS by comparing existing information concerning Contaminant levels in such areas with appropriate, conservative screening values as set forth in the screening level guidances in Section 15 of Attachment 4. To the extent that AK Steel proposes to eliminate any areas from further investigation based on this initial screening, the CCR shall (i) identify each area to be eliminated from further investigation, (ii) summarize the existing information concerning Contaminant levels in each such area and evaluate whether the existing data is sufficient to adequately characterize Contaminant levels in the area, and (iii) identify all screening values relied upon by AK Steel;
- Develop a preliminary conceptual site model that identifies potential source areas, release mechanisms, transport mechanisms, migration and exposure pathways, and exposure points/areas for both human and ecological receptors;

- Identify existing Interim Measures/corrective measures; and
- Identify data gaps.

The CCR shall be based on readily available information. The CCR shall serve as a baseline conditions report upon which the RFI/CMS Workplans required pursuant to Part 3 will build. Based on the approved CCR and Project Management Plan referred to in Part 2 below, AK Steel shall identify gaps in available data concerning the Facility and Additional Areas and develop investigations that address the data gaps in the RFI/CMS Workplans described in Part 3 below.

If any of the information specified below in Part 1 of this SOW is not available, AK Steel shall so indicate in the relevant section(s) of the CCR. The CCR shall contain information that is consistent with and builds on the data previously gathered regarding the Facility and Additional Areas, including the information contained in the Preliminary Assessment/Visual Site Inspection (PA/VSI) report prepared by an EPA contractor. AK Steel shall identify the Data Quality Objectives (DQOs) and level of data quality associated with any previously gathered data on which AK Steel proposes to rely, and shall provide and/or reference supporting QA/QC information for any existing data which has not been previously approved by EPA. The CCR may include, and during implementation of the RFI and CMS required by this SOW AK Steel may consider and use, previously collected data to the extent consistent with “Guidance Regarding Historical Data Usage in RCRA Facility Investigations In Region 5,” USEPA Region 5, May 8, 1998 or to the extent such data were collected in accordance with provisions of a QAPP previously approved by EPA, provided that such data is used in a manner consistent with identified DQOs.

A. Facility Background

AK Steel's CCR shall summarize the regional location, pertinent boundary features, general physiography, hydrogeology, and historical use of the Facility and Additional Areas for the treatment, storage, or disposal of Contaminants. The CCR shall include:

1. *Maps.* All maps shall be of sufficient detail and accuracy to locate and report all current and future work performed at the site. Aerial photographs may be used with HWMUs, SWMUs, AOCs, and other source areas superimposed on them. Maps shall depict the following, to the extent that the information is readily available:

- General geographic location;
- Property lines, with the owners of all adjacent property clearly indicated;
- Topography and surface drainage depicting all waterways, wetlands, flood plains,

water features, drainage patterns, and surface-water containment areas;

- All tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features;
- All solid or hazardous waste treatment, storage, or disposal areas active after November 19, 1980;
- All past solid waste treatment, storage or disposal areas, regardless of whether they were active on or after November 19, 1980;
- Any other areas identified in Exhibit A and/or depicted in Exhibits B and C to this SOW;
- All past and present product and waste underground tanks or piping;
- All past and present wastewater treatment and disposal facilities, including infiltration lagoons;
- Land uses (residential, commercial, industrial, agricultural, recreational, natural and undeveloped areas) at the Facility and surrounding areas;
- The location of all municipal, public, private, and industrial wells, along with all monitoring wells, at the Facility and Additional Areas and within a 1-mile radius of the Facility and Additional Areas. These wells shall be clearly labeled at ground and top of casing elevations and construction details included, if available (these elevations and details may be included as an attachment); and
- Wind rose and meteorology.

2. A history and description of ownership and operation, solid and hazardous waste generation, treatment, storage and disposal activities, and wastewater treatment, storage and disposal activities at the Facility and Additional Areas, to the extent that such information is obtainable from readily available information.

3. Approximate dates or periods of past product and waste spills at the Facility and Additional Areas, identification of the materials spilled, the amount spilled, the location where spilled, and a description of the response actions conducted (local, State, or Federal response units or private parties), including any inspection reports or technical reports generated as a result of the response, to the extent that such information is obtainable from readily available information.

4. A summary of past permits applied for and/or received, any enforcement actions and their subsequent responses and a list of documents and studies prepared for the Facility and Additional Areas, to the extent that such information is obtainable from readily available information. This may include information from previous and/or present owner/operators, if available.

5. A general description of major habitat types (e.g., grasslands, forests, lakes, streams, wetlands) located in and adjacent to the Facility and Additional Areas. In delineating wetlands, the U.S. Fish and Wildlife Service's National Wetland Inventory maps should be consulted. The U.S. Army Corps of Engineers should be consulted and wetlands should be delineated using the Federal Manual for Identifying and Delineating Jurisdictional Wetlands.

6. A general description of plants and animals at and adjacent to the Facility and Additional Areas, including the following: qualitative observations of resident plants and animals (birds, mammals, fish, stream benthos, etc.); and classification of vegetation community types. Threatened and endangered species possibly on or near the Facility and Additional Areas should be identified.

B. Preliminary Assessment of Nature and Extent of Contamination

The CCR shall describe the existing information on the nature and extent of Contamination at and adjacent to the Facility and Additional Areas.

1. The CCR shall summarize all known and currently suspected source areas of Contamination, including all HWMUs, SWMUs, AOCs, spill areas, and other areas identified in Exhibit A to this SOW or and/or depicted in Exhibits B and C to this SOW. For each area, AK Steel shall identify the following:

- Location of unit/area (to be depicted on Facility map referenced in Part 1.A.1);
- Quantities of Contaminants (both managed and spilled or released);
- Type of Contaminants to the extent known;
- A summary of the results of previous investigations; and
- Identification of areas where additional information is necessary.

2. The CCR shall include a preliminary assessment and description of the nature and extent of Contamination at and adjacent to the Facility and Additional Areas. This shall include:

- For each medium (e.g., soil, groundwater, surface water, sediments, etc.), a summary of any readily available information concerning the nature and extent of

Contamination. This description shall include all available monitoring data and qualitative information on the locations and levels of Contamination at and adjacent to the Facility and Additional Areas to the extent consistent with “Guidance Regarding Historical Data Usage in RCRA Facility Investigations In Region 5,” USEPA Region 5, May 8, 1998 or to the extent such data were collected in accordance with provisions of a QAPP previously approved by EPA; provided that such use of the data is consistent with identified DQOs. Include bio-data (e.g., fish kills, distressed vegetation, abnormal individuals of a species, carcasses, tissue studies, etc.). Include an assessment of the data quality and associated DQOs (and any limitations on appropriate use of the data), a map showing the location of all existing sampling points and potential source areas, and contour maps showing any existing groundwater plumes at and extending beyond the Facility; and

- A list and brief description of all previous investigations that have occurred at the Facility and Additional Areas, including identification of the entity that conducted the investigation, identification of any agency that requested the investigation, and identification of any agency contacts with respect to the investigation.

C. Preliminary Site Conceptual Model

The CCR shall identify the potential impact(s) on human health and the environment, including potential exposure pathways, migration routes, and potential receptors for all relevant land use scenarios related to the Contamination identified in Part 1, Paragraphs B.1 and 2 above. A site-conceptual model shall be included which illustrates these pathways, routes, and receptors. The CCR shall include a description of:

- All potential migration pathways, including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, foodwebs, meteorology, air quality, chemistry, fate and transport characteristics associated with affected media, and natural attenuation, as appropriate;
- Physical properties of known Contaminants;
- Areas where off-site migration of Contaminants has occurred or reasonably may be expected to occur;
- Media-specific potential human exposure pathways (e.g., ingestion, inhalation, dermal contact), including groundwater and surface water use;
- Potential ecological exposure areas and receptors;

- Current and future land use;
- Current or potential receptors at risk, including demography and identification of possible sensitive subpopulations (e.g., schools, homes for the elderly, hospitals, and sensitive ecosystems); and
- Preliminary Remediation Goals (PRGs) for detected Contaminants, which may be used as guidance for scoping and conducting the RFI.

D. Description of Interim/Stabilization Measures

The CCR shall document past and present interim/stabilization measures at the Facility other than those required to be implemented pursuant to the Consent Decree and its Attachment 1. This shall include a discussion of:

- Objectives of the interim/stabilization measures, including how the measure is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long-term solution at the Facility;
- Permitting, design, construction, operation, and maintenance requirements; and
- Description of the zone of capture of the existing AK Steel groundwater pumping system, and supporting documentation.

Part 2: Project Management Plan

AK Steel shall submit for review and approval in accordance with Section IX of the Consent Decree a Project Management Plan (PMP) as set forth in more detail below. The PMP shall provide AK Steel's proposed overall technical and management approach to the RFI and CMS for the Facility and Additional Areas, including a detailed discussion of how AK Steel proposes to organize and conduct the RFI and CMS for the Facility and Additional Areas. The PMP may provide for dividing the RFI and/or CMS for the Facility and Additional Areas into separate phases or components:

- (i) addressing releases from individual HWMUs, SWMUs, AOCs, spill areas, or other suspected source areas, or from groups of HWMUs, SWMUs, AOCs, spill areas, or other suspected source areas; or
- (ii) on a media-specific basis,

consistent with the provisions of this Part 2.

The PMP shall provide a detailed description of each phase or component of the RFI and CMS, a schedule for submission of RFI Workplans (in accordance with Part 3 of this SOW) for each such phase or component, and the supporting rationale to justify the proposed approach. The rationale shall include an analysis of how each phase or component relates to the conceptual site model and to an assessment of human health and ecological risk for the Facility and Additional Areas as a whole.

A. The PMP shall establish priorities for expediting implementation of the following phases or components of the RFI and CMS for the Facility and Additional Areas:

1) submission of an RFI/CMS Workplan and completion of RFI and CMS activities relating to the “OMS area landfills” (SWMUs 38 and 39);

2) submission of RFI Workplan(s) and completion of RFI activities relating to:

- (i) the past releases of coke oven gas and benzene from the melt area;
- (ii) the remainder of the OMS area;
- (iii) the TCE plume in the vicinity of AK Steel Monitoring Well GM 27-S, including identification of and further delineation of the source(s) of such plume; and
- (iv) any other portions of the Facility and Additional Areas that (A) include or are situated above, or may contain sources that release Contaminants into, a perched or upper aquifer, and/or (B) include or may contain sources that release Contaminants into, portions of the intermediate or lower aquifer which are or may be outside the zone of capture of the existing AK Steel groundwater pumping system.

B. The PMP shall also provide for: (i) defining the zone of capture of the existing AK Steel groundwater pumping system, and evaluating the impact of AK Steel’s pumping activities on groundwater flow patterns at and adjacent to the Facility; and (ii) submission of a CMS Workplan to evaluate corrective action alternatives to address groundwater contamination on a Facility-wide basis (other than any groundwater contamination from the OMS landfill areas, which will be addressed on an expedited basis, as provided above).

The PMP need not contain a detailed summary of past data collection efforts; that information will have been included in the CCR. The PMP shall be submitted in accordance with the schedule in Part 9 of this SOW.

Part 3: RFI and CMS Workplans

A. Purpose/Objectives

As provided in the schedules in the approved PMP and Part 9, below, AK Steel shall submit for review and approval in accordance with Section IX of the Consent Decree: (i) each of the Workplans referred to in Part 2, Paragraphs A and B, above; and (ii) an RFI and/or CMS Workplan, as applicable, for each other phase or component of the RFI and CMS identified in the approved PMP. The purpose of the Workplans is to describe the specific plans for determining the nature, extent, and impact of Contamination at and adjacent to the Facility and Additional Areas and for developing any additional information needed to prepare a Corrective Measures Study (CMS) which meets the requirements of this SOW and the Consent Decree.

The Workplan for each such phase or component shall include a detailed description of the tasks to be performed during that phase or component, the information needed for each task, the information to be produced during and at the conclusion of each task, and the work products that will be submitted. The Workplan for each RFI component identified in the approved PMP shall describe how AK Steel will obtain all of the information specified in Parts 5 and 6 of this SOW relevant to that phase or component of the RFI. Collectively, the Workplans governing RFI activities shall provide for AK Steel to obtain all of the information required under Parts 5 and 6 of this SOW, except to the extent that AK Steel demonstrates that particular items of information specified in Parts 5 or 6 are not relevant to investigation of the Facility or Additional Areas. The Workplan for each CMS component identified in the approved PMP shall describe how AK Steel will obtain all of the information specified in Part 7 of this SOW. All Workplans required pursuant to this Part 3 shall be consistent with the approved PMP and CCR.

Workplans required pursuant to this Part 3 shall not be required to provide for additional investigation or analysis of sediment, surface water or PCB contamination in soil in any area listed below:

- Monroe Ditch;
- Reach 1 of Dicks Creek;
- Reach 2 of Dicks Creek;
- Outfall 002 Channel; or
- Floodplain areas investigated pursuant to the approved Floodplain
Soil Sampling and Analysis Plan
- Areas described in Attachment 1, Section II, Paragraphs 4.A and 5, that are
investigated pursuant to the approved Upland Sources Sampling and
Analysis Plan

except to the extent that there is reason to believe that there has been a release of Contaminants

from the Facility or Additional Areas

- (i) in or into Monroe Ditch, Reach 1 of Dicks Creek, Reach 2 of Dicks Creek, or the Outfall 002 Channel after the excavation and removal of contaminated sediments from such areas pursuant to Attachment 1, Section II, Paragraphs 6 or 7; or
- (ii) in or into Floodplain areas investigated pursuant to Attachment 1, Section II, Paragraphs 1 or 4 after the collection of the samples of such Floodplain areas required pursuant to the approved Floodplain Soil Sampling and Analysis Plan; or
- (iii) in or into the areas described in Attachment 1, Section II, Paragraphs 4.A and 5, after the investigation of such areas pursuant to the approved Upland Sources Sampling and Analysis Plan.

The Workplan for each RFI and CMS phase or component identified in the approved PMP shall be developed in a manner consistent with EPA's "Interim Final RCRA Facility Investigation (RFI) Guidance," Volume I, OSWER Directive 9502.00-6D, EPA 530/SW-89-031, May, 1989, the "RCRA Corrective Action Plan," OSWER Directive 9902.3-2A, May 1994, and other applicable guidance, including guidance identified in this SOW and Attachment 4 to the Consent Decree. Each such Workplan shall include a discussion of project management, quality assurance, data management and reporting, detailed descriptions of the methods and procedures for performing the required tasks, public involvement, and a proposed schedule for conducting the work. During the conduct of the RFI and/or CMS, it may be necessary to revise the Workplan for any RFI or CMS phase or component identified in the approved PMP to increase or decrease the detail of information collected to accommodate specific situations at and adjacent to the Facility and Additional Areas.

If, for any RFI phase or component identified in the approved PMP, EPA approves an RFI Report that concludes that there is no need for a CMS to evaluate potential corrective measure alternatives, AK Steel shall not be required to submit a CMS Workplan for such phase or component. If, for any RFI phase or component identified in the approved PMP, EPA (i) approves an RFI Report that recommends proceeding with a CMS; or (ii) disapproves or modifies AK Steel's conclusion that there is no need for a CMS Workplan to evaluate potential corrective action alternatives, AK Steel shall submit a CMS Workplan in accordance with the schedule in Part 9, subject to the Dispute Resolution provisions of Section XIII of the Consent Decree.

B. Project Management

As part of each Workplan, AK Steel shall address its overall project management consistent with the EPA approved PMP, including a discussion of the technical approach, levels of authority,

organizational chart, lines of communication, personnel, and a description of the qualifications of personnel performing or directing the RFI and/or CMS, including contractor personnel.

C. Data Collection Quality Assurance Project Plan (QAPP)

As part of the Workplan for each RFI and CMS phase or component identified in the approved PMP, AK Steel shall document all proposed monitoring procedures, sampling, field measurements and sample analyses to be performed during the RFI/CMS so as to ensure that all information and data meet the identified Data Quality Objectives (DQOs), and resulting decisions are technically sound, statistically valid, and properly documented. The quality assurance component of the RFI and CMS shall be prepared in accordance with applicable guidance, including guidance identified in Attachment 4 to the Consent Decree. AK Steel shall refer to the PRGs identified in the CCR when proposing analytical methods so as to ensure that detection limits are sensitive enough to achieve risk-based levels. A pre-QAPP meeting may be held prior to preparation of the QAPP. If held, AK Steel shall notify and afford an opportunity to participate to its QAPP preparer, laboratory representatives, EPA Project Coordinator, EPA Quality Assurance representatives, OEPA staff, and representatives of Intervenors.

A performance audit may be conducted by EPA or OEPA on the laboratories selected for analyses by AK Steel.

D. Detailed Description of the Tasks to be Performed

In the RFI and CMS Workplans required pursuant to this SOW, AK Steel shall describe in detail the methods and procedures for performing the tasks identified in Parts 5 through 8 of this SOW. For each investigation and data collection activity, AK Steel shall describe in detail the sampling and data-gathering methods that will be used to collect the data. AK Steel shall discuss how the specific tasks AK Steel will perform will meet the DQOs associated with the planned use of the data. For each investigation, AK Steel shall discuss previous sampling locations, analytical results, and other relevant information (visual observations, historical records, air photo analysis); the detailed objectives of the investigation, including DQOs; and how the specific work activities to be performed will meet the objectives of the investigation and be used in the RFI, the risk assessments, and the CMS. AK Steel shall include for each investigation a detailed description of the sampling locations, depths, and frequency; sampling equipment and procedures; field measurements, analyses, and procedures; sample preservation and handling; the field notes that will be collected; field quality assurance; planned analyses; standard operation procedures; decontamination procedures; and any procedures that will be implemented to protect the surrounding community from risks resulting from the investigation. AK Steel shall refer to the PRGs identified in the CCR when planning the delineation of the extent of Contamination at the Facility and Additional Areas.

In each RFI Workplan required pursuant to this SOW, AK Steel shall preliminarily identify corrective measures technologies that may have application to specific Contamination problems at the Facility and Additional Areas and describe any information (other than information identified in Parts 5 and 6 of this SOW) that will be collected during the RFI to support any subsequent evaluation of such technologies during the CMS. In each CMS Workplan required pursuant to this SOW, AK Steel shall describe the general approach to investigating and evaluating potential corrective measures.

At the earliest opportunity, and not later than the Alternatives Summary Report for each CMS phase or component identified in the approved PMP, AK Steel shall also identify any pilot, laboratory, or bench scale studies that may need to be undertaken in support of corrective measures evaluation.

The Workplan for each RFI phase or component identified in the approved PMP shall include a proposed outline for the RFI Report required pursuant to Part 6 of this SOW for that phase or component, including a description of how information will be presented. The Workplan for each CMS phase or component identified in the approved PMP shall include a proposed outline of the CMS Report required pursuant to Part 7 of this SOW for that phase or component, including a description of how information will be presented.

E. Data Management and Reporting

As part of the Workplan for each RFI phase or component identified in the approved PMP, AK Steel shall propose data management and reporting procedures to document and track RFI data and results. This section of each such Workplan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the RFI phase or component.

As a final output, all locational, soil, sediment, water and groundwater data shall be submitted in an electronic database suitable for display in a GIS format.

F. Public Involvement

Each Workplan submitted pursuant to this SOW shall provide for public involvement activities relating to the phase or component of the RFI or CMS covered by that Workplan, including a schedule for community relations activities. This schedule for community relations activities may be revised as appropriate, with EPA approval following reasonable opportunity to comment by OEPA and Intervenors. In any public statement relating to the RFI and/or CMS, whether issued pursuant to the approved plan or not, AK Steel shall not appear to represent or speak for the EPA, OEPA or Intervenors before the public, other government officials, or the media.

Public involvement activities required of AK Steel may include the following:

- Conducting open house and informal meetings (i.e., availability session) in public locations where people can talk to representatives of EPA, OEPA and AK Steel on a one-to-one basis;
- Preparing fact sheets summarizing current or proposed RFI/CMS activities (all fact sheets shall be submitted to the EPA, OEPA and Intervenors for review, prior to public distribution); and
- Maintaining an easily accessible repository (such as a municipal building or public library) of information on the RFI and CMS, including the Consent Decree, approved workplans and reports, each CMS Report required pursuant to this SOW, public involvement materials, and other submittals required by the Consent Decree or attachments thereto.

G. RFI/CMS Schedule

The Workplan for each RFI and CMS phase or component identified in the approved PMP shall include a proposed schedule, including identification of critical path elements and dependencies, for the activities to be implemented during that phase or component. The proposed schedule for each RFI and CMS phase or component identified in the approved PMP shall incorporate applicable elements set forth in Part 9 of this SOW, and provide a detailed timetable for initiation and completion of all other activities to be implemented during that phase or component, including:

1. Sampling
2. Analysis
3. Field Work
4. Evaluation/Screening of Potential Risks
5. Submittal of Reports
6. Laboratory or Bench-Scale Studies
7. Development and Screening of Corrective Measures Alternatives
8. Evaluation of Corrective Measures Alternatives

9. Recommendation by AK Steel of Final Corrective Measures Alternative(s)

10. Public Involvement

The Workplans shall include separate schedules, including identification of critical path elements and dependencies, with expedited deadlines, consistent with Part 2 of this SOW, for conducting the RFI and CMS phases or components identified in Subpart 2.A of this SOW.

Part 4: Health and Safety Plan

AK Steel shall prepare and submit to EPA, OEPA and Intervenors for review a Health and Safety Plan. The Health and Safety Plan is not approved by EPA pursuant to Section IX of the Consent Decree, however EPA may submit comments on the Health and Safety Plan.

1. Major elements of the Health and Safety Plan include:

- A description of the Facility and Additional Areas, including availability of resources such as roads, water supplies, electricity and telephone services;
- A description of the known hazards and evaluation of the risks associated with conducting the RFI/CMS at the Facility and Additional Areas;
- A list of key personnel and alternates responsible for site safety, response operations, and for protection of human health;
- A description of the levels of protection to be worn by personnel;
- Delineation of the exclusion zones within the work areas;
- Procedures to control site access;
- A description of decontamination procedures for personnel and equipment;
- Site emergency procedures;
- Emergency medical care for injuries and toxicological problems;
- A description of requirements for an environmental surveillance program;
- A description of routine and special training required for response personnel; and

- Procedures for protecting workers from weather-related problems.

2. The Health and Safety Plan shall be consistent with:

- NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
- EPA Order 1440.1 - Respiratory Protection;
- EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;
- Any Facility Contingency Plan;
- EPA Standard Operating Safety Guide (1984);
- OSHA regulations particularly in 29 C.F.R. 1910 and 1926;
- State and local regulations; and
- Other EPA guidance as appropriate.

AK Steel shall revise and update the Health and Safety Plan as necessary to ensure that it adequately addresses all work undertaken pursuant to this SOW. AK Steel shall submit any updated Health and Safety Plan to EPA, OEPA and Intervenor for review prior to implementing activities covered by the updated Health and Safety Plan. EPA may submit comments on any updated Health and Safety Plan.

Unless the Parties agree that other measures of personal protection are appropriate for particular activities or areas, representatives from EPA and OEPA agree to wear safety glasses with permanently affixed side shields, hard hats, long sleeve shirts, long pants, and leather steel toed shoes with metatarsal protection when visiting the Facility in connection with implementation of the RFI or CMS, except that rubber boots may be worn in lieu of leather steel toed shoes with metatarsal protection for investigatory activities in Floodplain areas, Dicks Creek and Monroe Ditch. The Defendant shall supply leather steel-toed shoes with metatarsal protection upon request by EPA and OEPA. Intervenor shall comply with the safety practices specified in Attachment 8 of the Consent Decree.

Part 5: Facility Investigation

A. Purpose/Objectives

As discussed in more detail below in this Part 5, AK Steel shall conduct additional investigations (including sampling and analyses) needed to characterize the Facility and Additional Areas (Environmental Setting), define source(s) of Contamination (Source Characterization), define the degree and three dimensional extent of Contamination (Contamination Characterization), identify actual or potential receptors (Potential Receptors Identification), and assess risk. The investigations shall result in data of adequate technical quality consistent with approved quality assurance criteria to support the assessment of risk and the development and evaluation of corrective measure alternative(s) during the CMS.

AK Steel must have EPA approval prior to implementing the activities described in any Workplan required pursuant to Part 3 of this SOW. AK Steel shall implement all investigations and activities described in approved Workplans (including sampling and analysis of samples) in accordance with the terms and schedules set forth in the approved Workplans, including any revisions to such schedules approved by EPA.

B. Environmental Setting

As part of the RFI, AK Steel shall collect information to supplement and verify existing information on the environmental setting at the Facility and Additional Areas, including each of the elements identified below in this Part 5.

1. Hydrogeology

The RFI shall include a program to supplement past studies of hydrogeologic conditions at and adjacent to the Facility and Additional Areas, as needed to develop the following information:

- An updated description of the regional and Facility-specific geologic and hydrogeologic characteristics affecting groundwater flow beneath the Facility and Additional Areas, including:
 - Regional and Facility-specific stratigraphy including: description of strata including strike and dip, and identification of stratigraphic contacts;
 - Structural geology including: description of local and regional structural features (e.g., folding, faulting, tilting, jointing, etc.);
 - Depositional history;

- Areas and amounts of recharge and discharge;
 - Regional and Facility-specific groundwater flow patterns;
 - Seasonal variations in the groundwater flow regime; and
 - Variations in groundwater flow regime related to fluctuations in river, stream, creek, ditch and channel stage.
- An analysis of any topographic features that might influence the groundwater flow system.
 - AK Steel shall classify and describe the hydrogeologic units at and adjacent to the Facility and Additional Areas (i.e., the aquifers and any intervening saturated and unsaturated zones) based on field data, tests, cores, groundwater monitoring wells, and piezometers. Data collected shall include:
 - Hydraulic conductivity, intrinsic permeability, particularly when non-aqueous phase liquids (NAPLs) are present, and porosity (total and effective);
 - Lithology, grain size, sorting, degree of cementation;
 - Determination of vertical and horizontal hydraulic inter-connections between saturated zones; and
 - The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content, etc.).
 - Based on field studies, cores, groundwater monitoring wells and piezometers, structural geology and hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units that may act as pathways for Contaminant migration, identifying each of the following, if present:
 - Sand and gravel in unconsolidated deposits;
 - Zones of fracturing or channeling in consolidated and unconsolidated deposits;
 - Zones of higher permeability or low permeability that might direct and restrict the flow of Contaminants;

- The uppermost aquifer: geologic formation, group of formations, or part of a formation capable of yielding a significant amount of groundwater to wells, springs or seeps;
 - Water-bearing zones above the first confining layer that may serve as a pathway for Contaminant migration, including perched zones of saturation; and
 - All other geologic formations, or parts thereof, yielding a significant amount of groundwater.
- Based on data obtained from groundwater monitoring wells and piezometers installed upgradient and downgradient of the potential Contaminant source(s) and/or Contaminant plumes, a representative description of water level or fluid pressure monitoring including:
 - Water level contour and/or potentiometric maps;
 - Hydrologic cross sections showing vertical flow gradients;
 - The flow system, including the vertical and horizontal components of flow; and
 - Any temporal changes in hydraulic gradients (due to seasonal influences, rain events etc.).
 - A description of man-made influences that may provide preferential pathways for, or otherwise affect, migration of Contaminants at or from the Facility and Additional Areas, identifying:
 - Active and inactive local water-supply and production wells within a one mile radius of: (i) the Facility, (ii) Additional Areas and (iii) the limits of any Contaminant plume, with an approximate schedule of pumping of such wells; and
 - Man-made hydraulic structures (sewers, pipelines, french drains, ditches, ditch liners, Interceptor Trenches, unlined ponds, septic tanks, NPDES outfalls, retention areas, etc.).

2. Soils

AK Steel shall conduct a program to characterize the soil and rock units potentially affected by Contaminant release(s) at the Facility and/or Additional Areas; provided, however, that the requirements of this Subpart 5.B.2 shall not apply to Floodplain areas investigated pursuant to the approved Floodplain Soil Sampling and Analysis Plan or the areas described in Attachment 1, Section II, Paragraphs 4.A and 5 that are investigated pursuant to the approved Upland Sources Sampling and Analysis Plan, except to the extent that there is reason to believe that there has been a release of Contaminants from the Facility or Additional Areas into such areas after the collection of samples in such areas pursuant to the approved Floodplain Soil Sampling and Analysis Plan or the approved Upland Sources Sampling and Analysis Plan, respectively.

Such characterization shall include the following information, as applicable:

- Where remediation by removal of soils has been preliminarily identified in the approved RFI Workplan as a corrective measures technology that may have application to the subject RFI phase or component, provide map(s) and perpendicular cross sections showing:
 - The extent of Contamination;
 - Depth to groundwater; and
 - The consistency and distribution of soils [using the Unified Soil Classification System (ASTM D 2487)];

and provide the following information:

- Depth to bedrock and the relevant characteristics of the bedrock including any discontinuities such as faults, fissures, joints, fractures, sinkholes, etc.;
- A detailed soil survey conducted according to USDA Soil Conservation Service (SCS) procedures including:
 - USDA Textural Soil Classification and soil profiles showing stratifications or zones which may affect or direct the subsurface flow;

- Hydraulic conductivity and the SCS hydrologic group classification of A, B, C or D;
- Relative permeability (only if the waste may have changed the soil's hydraulic conductivity, such as concentrated organics);
- Storage capacity (if excavated soil will be stored);
- Shrink-swell potential (where extreme dry weather could lead to the formation of cracks);
- Potential for Contaminant transport via erosion, using the Universal Soil Loss Equation;
- Soil sorptive capacity;
- Cation exchange capacity;
- Soil organic content; and
- Soil pH.
- The following Contaminant characteristics shall be included:
 - Physical state;
 - Viscosity;
 - pH;
 - pKa;
 - Density;
 - Water solubility;
 - Henry's Law Constant;
 - K_{ow} ;

- Biodegradability; and
 - Rates of hydrolysis, photolysis and oxidation.
- Where in-situ soil treatment has been preliminarily identified in the approved RFI Workplan as a corrective measures technology that may have application to the subject RFI phase or component, the above information and the following additional information shall be provided:
 - Bulk density;
 - Porosity (total and effective);
 - Grain size distribution;
 - Mineral content;
 - Soil moisture profile;
 - Unsaturated hydraulic conductivity;
 - Effect of stratification on unsaturated flow; and
 - Infiltration and evapotranspiration.

3. Surface Water and Sediment

The RFI shall include a program to characterize those surface water bodies, including the Great Miami River (as it relates to Outfall 011 between River Mile 52.0 and River Mile 49.0), that may be affected by releases from the Facility and Additional Areas; provided, however, that the requirements of this Subpart 5.B.3 shall not apply to any area listed below unless, after excavation and removal of contaminated sediment from such area pursuant to applicable provisions of Attachment 1, Section II, Paragraph 6 or 7, there is reason to believe that there has been a release of Contaminants into that area from the Facility or Additional Areas:

Monroe Ditch;
Reach 1 of Dicks Creek;
Reach 2 of Dicks Creek; or
Outfall 002 Channel.

Such characterization shall include the following activities and information:

- Description of the temporal and permanent surface water bodies including:
 - For any impoundments: location, elevation, surface area, depth, volume, freeboard, and purpose of impoundment;
 - For any rivers, streams, ditches, drains, wetlands and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies (i.e., 100-year event);
 - Delineation of any wetlands;
 - Containment measures in place (e.g., levees, concrete lining, etc.);
 - Drainage patterns; and
 - Evapotranspiration rates.
- Description of the chemistry of the surface water and sediments, including determination of:
 - pH;
 - total dissolved solids;
 - total suspended solids;
 - biochemical oxygen demand;
 - alkalinity;
 - conductivity;
 - dissolved oxygen profiles;
 - nutrients (NH_3 , $\text{NO}_3^-/\text{NO}_2^-$, PO_4^{3-});
 - chemical oxygen demand;
 - total organic carbon.

- Description of sediment characteristics including:
 - Deposition area;
 - Thickness profile; and
 - Physical parameters (e.g., grain size, density, ion exchange capacity, etc.).

4. Air

AK Steel shall provide information characterizing the climate in the vicinity of the Facility and Additional Areas. Such information shall include:

- A description of the following parameters:
 - Annual and monthly rainfall averages;
 - Monthly temperature averages and extremes;
 - Wind speed and direction;
 - Relative humidity/dew point;
 - Atmospheric pressure;
 - Evaporation data;
 - Development of inversions; and
 - Climate extremes that have been known to occur in the vicinity of the Facility and Additional Areas, including frequency of occurrence.
- A description of topographic and man-made features that affect air flow and emission patterns, including as applicable:
 - Ridges, hills, or mountain areas;
 - Canyons or valleys;
 - Surface water bodies (e.g., rivers, lakes, etc.);

- Wind breaks and forests; and
- Buildings.

C. Source Characterization

As part of the RFI, AK Steel shall collect data, including analytical data, necessary to characterize the wastes and the locations at the Facility and Additional Areas where wastes have been placed, collected, removed or have migrated to, including: type; quantity; physical form; disposition (containment or nature of disposal); and any Facility characteristics that may affect or have affected a release (e.g., Facility security, integrity of engineered barriers). SWMUs 38 and 39 shall be investigated via intrusive investigations as specified in Exhibit D attached hereto. As necessary, AK Steel shall conduct intrusive investigations into other closed HWMUs, SWMUs, AOCs, spill areas, and other suspected source areas to characterize the wastes placed within such units. The source area investigations shall incorporate information in the approved CCR and develop additional information, consistent with Workplan(s) submitted pursuant to Part 3 of this SOW and approved by EPA, regarding the following specific characteristics at each source area to address any data gaps identified in the CCR:

1. Unit/Disposal Area/Area of Concern Characteristics:

- Location of unit/disposal area;
- Type of unit/disposal area;
- Design features;
- Operating practices (past, to the extent practical, and present), including closure activities and any history of releases, to the extent practical;
- Period of operation;
- Age of unit/disposal area;
- General physical conditions; and
- Method used to close or remediate the unit/disposal area.

2. Waste Characteristics:

- Type of waste placed in the unit;

- Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing or reducing agent);
- Quantity; and
- Chemical composition.
- Physical and chemical characteristics;
 - Physical form (solid, liquid, gas);
 - Physical description (e.g., powder, oily sludge);
 - Temperature;
 - pH;
 - General chemical class (e.g., acid, base, solvent);
 - Molecular weight;
 - Density;
 - Boiling point;
 - Viscosity;
 - Solubility in water;
 - Cohesiveness of the waste;
 - Vapor pressure; and
 - Flash point.
- Migration and dispersal characteristics of the waste;
 - Sorption;
 - Biodegradability, bioconcentration, biotransformation;

- Photodegradation rates;
- Hydrolysis rates; and
- Expected chemical transformations.

AK Steel shall document the procedures used in making the above determinations.

D. Contamination Characterization

As specified in Workplan(s) submitted pursuant to Part 3 of this SOW and approved by EPA, AK Steel shall collect analytical data on environmental media, including groundwater, soils, surface water, sediment, and air likely to be affected by releases from the Facility and Additional Areas, except as provided below in this Subpart 5.D. This data shall be sufficient to define the extent, origin, direction, and rate of movement of Contaminants. Data shall include:

- time and location of sampling;
- media sampled;
- concentrations found;
- conditions during sampling; and
- the identity of the individuals performing the sampling and analysis.

AK Steel shall address the following types of Contamination at the Facility and Additional Areas:

1. Groundwater Contamination

As specified in Workplan(s) submitted pursuant to Part 3 of this SOW and approved by EPA, AK Steel shall conduct a groundwater investigation to fully characterize any plumes of Contamination at or emanating from the Facility and Additional Areas. This investigation shall provide the following information:

- A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Facility and/or Additional Areas;
- The horizontal and vertical direction of Contaminant movement;

- The velocity of Contaminant movement;
- The horizontal and vertical concentration profiles of Contaminants in the plume(s);
- An evaluation of factors influencing the plume movement;
- An extrapolation of future Contaminant movement; and
- The potential for groundwater impacts on surface waters and sediments, including waters and sediments of the Great Miami River, Monroe Ditch and Dicks Creek.

AK Steel shall document the procedures used in making the above determinations (e.g., well design, well construction, sampling, field measurements, geophysics, modeling, etc.).

2. Soil Contamination

As specified in Workplan(s) submitted pursuant to Part 3 of this SOW and approved by EPA, AK Steel shall conduct an investigation to characterize the Contamination of the soil and rock units above the water table and in the smear zone, if present, at the Facility and Additional Areas, provided, however, that nothing in this Subpart 5.D.2 shall require further investigation of PCB contaminated soils in Floodplain areas investigated pursuant to the approved Floodplain Sampling and Analysis Plan or the areas described in Attachment 1, Section II, Paragraphs 4.A and 5, that are investigated pursuant to the approved Upland Sources Sampling and Analysis Plan, except to the extent that there is reason to believe that there has been a release of PCBs from the Facility or Additional Areas into such areas after the collection of samples in such areas pursuant to the approved Floodplain Soil Sampling and Analysis Plan or the approved Upland Sources Sampling and Analysis Plan, respectively.

The characterization of soil contamination shall include the following information:

- A description of the vertical and horizontal extent of Contamination;
- A description of Contaminant and soil chemical properties within the Contaminant source area and plume. This includes, as applicable, Contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation and other factors that might affect Contaminant migration and transformation;
- Site-specific Contaminant concentrations;

- Velocity and direction of Contaminant movement; and
- An extrapolation of future Contaminant movement.

AK Steel shall document the procedures used in making the above determinations.

3. Soil Vapor

As specified in Workplan(s) submitted pursuant to Part 3 of this SOW and approved by EPA, AK Steel shall conduct a program to characterize the soil vapor underlying the Facility and Additional Areas. Such characterization shall include the following information, as appropriate:

- Determination if immediate action is needed for mitigation of risks to human health from Contaminant soil vapor exposure:
 - ▶ strong odors
 - ▶ wet structures, which may include basements or slabs situated near shallow groundwater
 - ▶ safety issues such as detection of lower explosive limits
- Description of chemical Contaminants found at the Site:
 - ▶ volatility
 - ▶ toxicity
 - ▶ ability to biodegrade
- Description of geological and/or hydrological layers and soil types that may contain soil vapors and/or that may act as preferential pathways for soil vapor:
 - ▶ unsaturated soils
 - ▶ uppermost portions of groundwater and/or capillary fringe
- Identification and description of subsurface utilities/structures that may provide preferential pathways for vapor migration:
 - ▶ storm/sanitary sewers

- ▶ natural gas lines
- ▶ other utility structures/conduits
- ▶ anthropogenic fill material more permeable than native geologic unit
- ▶ presence of sumps, crawl spaces, basements without floors, cracked foundations, or other significant openings to underlying soil in inhabited buildings.
- Descriptions may make use of investigational tools to insure that volatile Contaminants can be detected, such as:
 - ▶ direct measurements of vapor intrusion
 - ▶ site models
 - ▶ data quality objectives
 - ▶ appropriate detection levels for groundwater
- Identification of inhabited buildings that are located within 100 feet either laterally or vertically of known volatile Contaminants in soil or groundwater
- Evaluation of indoor air quality, if available, which may include:
 - ▶ subslab soil gas data
 - ▶ indoor air concentrations
 - ▶ background and ambient air quality evaluation
 - ▶ determination of potential pathways
- Determination if nature and extent of contaminated groundwater is adequately characterized in order to correlate groundwater information with soil vapor data.

4. Surface Water and Sediment Contamination

As specified in Workplan(s) submitted pursuant to Part 3 of this SOW and approved by EPA, AK Steel shall conduct a surface water and sediment investigation to characterize the potential

for Contamination of surface water bodies and sediments as a result of any ongoing releases or migration of Contaminants at or from the Facility and Additional Areas as well as the potential for Contamination from storm water runoff. The investigation shall include the following information:

- A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Facility and/or Additional Areas and the extent of Contamination in underlying sediments;
- The horizontal and vertical direction of Contaminant movement;
- The Contaminant velocity;
- An evaluation of the physical, biological, and chemical factors influencing Contaminant movement;
- An extrapolation of future Contaminant movement; and
- A description of the chemical and physical properties of the contaminated surface waters and sediments, including determinations of pH, total dissolved solids, specific Contaminant concentrations, etc., provided, however, that AK Steel shall only be required to develop information about chemical and physical properties of surface waters and sediments in Monroe Ditch, Reach 1 and Reach 2 of Dicks Creek and the Outfall 002 channel to the extent that there is reason to believe that there has been a release of Contaminants from the Facility or Additional Areas in or into Monroe Ditch, Reach 1 of Dicks Creek, Reach 2 of Dicks Creek, or the Outfall 002 Channel after the excavation and removal of Contaminated sediments from such areas pursuant to Attachment 1, Section II, Paragraphs 6 or 7.

AK Steel shall document the procedures used in making the above determinations.

5. Air Contamination

As specified in Workplan(s) submitted pursuant to Part 3 of this SOW and approved by EPA, AK Steel shall conduct an investigation to characterize the particulate and gaseous Contaminants released into the atmosphere from any HWMUs, SWMUs, AOCs, spill areas, and other suspected source areas at the Facility and Additional Areas. This investigation shall provide the following information:

- A description of the horizontal and vertical direction and velocity of Contaminant movement;

- The rate and amount of the release;
- The chemical and physical composition of the Contaminant(s) released, including horizontal and vertical concentration profiles; and
- An evaluation of any depositional areas impacted by air contaminant releases.

AK Steel shall document the procedures used in making the above determinations.

E. Potential Receptor Identification

As part of the RFI, AK Steel shall collect data describing the human populations and environmental systems that currently or potentially are at risk of exposure to Contaminants from the Facility and/or Additional Areas. Chemical analysis of biological samples may be needed. Data on observable effects in ecosystems may also be required by EPA, after consultation with OEPA and Intervenors. The following characteristics shall be identified:

1. Local uses and possible future uses of groundwater:

- Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, public and industrial) and
- Location of groundwater users including wells and discharge areas.

2. Local uses and possible future uses of surface waters characterized pursuant to the "Environmental Setting" or "Contamination Characterization" Sections above (Subparts 5.B and 5.D);

- Domestic and municipal (e.g., potable and lawn/gardening watering);
- Recreational (e.g., swimming, fishing);
- Agricultural;
- Industrial; and
- Environmental (e.g., habitat, foraging areas, fish and wildlife propagation).

3. Human use of or access to the Facility, Additional Areas, including but not limited to:

- Recreation;
- Hunting/Fishing;
- Residential;
- Commercial;
- Zoning; and
- Relationship between population locations and prevailing wind direction.

4. A demographic profile of the people who use or have access (authorized or unauthorized) to the Facility, Additional Areas, including, but not limited to: age; sex; income and ethnicity.

5. A description of the ecological characteristics of the Facility, Additional Areas and adjacent areas, including habitat and species present and expected to be present.

6. A description of the biota in surface water bodies on, adjacent to, or affected by the Facility and/or Additional Areas.

7. A description of any State and Federal endangered or threatened species (both proposed and listed) at or near the Facility and/or Additional Areas.

F. Risk Assessment Assumptions Report

At the conclusion of the RFI data collection and analysis activities for each RFI phase or component identified in the approved PMP, AK Steel shall prepare and submit for review and approval in accordance with Section IX of the Consent Decree a Risk Assessment Assumptions Report (RAAR). The RAAR shall provide a revised conceptual site model based on the data collected during the RFI. As part of the revised conceptual site model for ecological risks, the RAAR shall identify habitat areas where exposure pathways for ecological receptors are potentially complete. The RAAR shall identify any HWMUs, SWMUs, AOCs, spill areas, and other suspected source areas at the Facility and Additional Areas which AK Steel proposes to screen from further consideration based on a screening risk evaluation, using appropriate, conservative screening values, as set forth in the screening level guidances in Section 15 of Attachment 4, when screening to determine whether further investigation is required. The RAAR shall present the results and all supporting information relied upon in conducting the screening risk evaluation.

The RAAR shall identify the approach that will be used to evaluate risks associated with potential exposure to Contaminants at or released from each HWMU, SWMU, AOC, spill area and other suspected source area at the Facility or Additional Area that is not screened from further evaluation pursuant to the preceding Paragraph or the approved CCR. For each such HWMU, SWMU, AOC, spill area and other suspected source area with releases of multiple contaminants and/or multiple potential pathways of contamination, the RAAR shall provide for AK Steel to conduct human health and ecological risk assessments in accordance with Subpart 6.B, below. With respect to all other HWMUs, SWMUs, AOC, spill areas or other suspected source areas at the Facility or Additional Areas that are not screened from further evaluation pursuant to the preceding Paragraph or the approved CCR, the RAAR may provide for AK Steel to complete human health and ecological risk assessments as provided below in Subpart 6.B or to rely on established cleanup values as the basis for development of the CMS.

If AK Steel proposes to rely upon established cleanup standards as the basis for development of the CMS for any HWMU, SWMU, AOC, spill area or other suspected source area at the Facility or Additional Areas, the RAAR shall: (i) identify each such HWMU, SWMU, AOC, spill area or other source area; (ii) identify the cleanup standards applicable to each such area identified; and (iii) provide all supporting information relied upon in determining the applicability of the identified cleanup standards.

AK Steel shall identify in the RAAR all of the assumptions, inputs, and supporting information required to complete the human health and ecological risk assessments under reasonable maximum exposure conditions for both current and reasonably expected future land use scenarios, including the following:

- updated conceptual site model(s) (human health and ecological);
- all current and potential receptors to be evaluated;
- all exposure scenarios to be evaluated;
- all exposure media to be evaluated;
- all screening values and sources (toxicity-base and/or background, including the method(s) and data used to derive background concentrations), if any, used in the reduction of chemicals of potential concern;
- list of all chemicals of potential concern per medium;
- all risk assessment exposure assumptions needed to complete the human health risk assessment and the final ecological risk assessment level;
- all exposure point concentrations and equations used to derive those values; and,
- methods and input values that will be used to evaluate specific Contaminants, such as lead, or environments such as surface waters or wetlands, as may be needed.

AK Steel shall submit the RAAR in accordance with the schedule in the approved Workplans for RFI activities.

Part 6: RFI Reports

For each RFI phase or component identified in the approved PMP, AK Steel shall, upon completion of the field activities for such RFI phase or component, prepare and submit for review and approval in accordance with Section IX of the Consent Decree an RFI Report which incorporates the results of all previous reports relating to that RFI phase or component. Each RFI Report shall be comprehensive and sufficiently detailed to provide an adequate basis for decisions regarding the need for a CMS, the need for stabilization measures, and the appropriateness of any Interim Measures proposed by AK Steel pursuant to Paragraph 22 of the Consent Decree. For each RFI phase or component identified in the approved PMP, the RFI Report shall include AK Steel's recommendation regarding the need for a CMS to evaluate potential corrective measure alternatives for addressing releases at or from each HWMU, SWMU, AOC, spill area, and other suspected source area located in the area covered by that phase or component and shall set forth the basis for such recommendation.

Each RFI Report shall be prepared in a manner consistent with the RFI Guidance and other applicable guidance, including guidance identified in this SOW or in Attachment 4 to the Consent Decree, and shall include all of the information specified below in this Part regarding Data Analysis, Analysis of Risk, and Corrective Measures Objectives (CMOs). Each RFI Report shall be based upon an analysis of investigation data that is sufficient in quality (e.g., quality assurance procedures have been followed; DQOs have been met) and quantity to describe the nature and extent of Contamination, the potential threat to human health and/or the environment, and to support a Corrective Measures Study. The RFI Report for each RFI phase or component identified in the approved PMP shall be submitted in accordance with the schedule in the approved Workplan for that RFI phase or component. The conceptual site model shall be updated in each RAAR to ensure that human health and the environment are protected on a site-wide basis.

A. Data Analysis

The RFI Report shall include a summary and analysis of all investigation data, together with any additional relevant information in the Current Conditions Report, and provide a detailed description of the sources, type, and extent of Contamination, and the migration pathways at the Facility and Additional Areas. The RFI Report shall describe the extent of Contamination in relation to background levels indicative of the area as well as in relation to applicable Media Cleanup Standards as developed under Subpart 6.C, Corrective Measures Objectives, below.

B. Analysis of Risk

As provided in the RAAR, AK Steel shall conduct an assessment of human health risks and ecological risks associated with exposure to Contaminants at and adjacent to the Facility and Additional Areas, in accordance with Paragraphs 1 and 2 of this Subpart 6.B. The estimates of risk must estimate both human health and ecological risks under reasonable maximum exposure conditions for both current and reasonably expected future land use scenarios. For purposes of the human health risk assessment, the current and reasonably expected future land use of the AK Steel property may be considered to be “industrial/commercial,” consistent with Section I of this SOW.

The RFI Report shall include a Human Health Risk Assessment Report and an Ecological Risk Assessment Report as provided below in this Subpart 6.B. Both the Human Health Risk Assessment Report and the Ecological Risk Assessment Report shall include a discussion of any major areas of uncertainty in the risk assessment, the direction of any such uncertainties, and the approaches used to address such uncertainties. Such discussion shall include a discussion of:

- Key areas of uncertainty and the degree of scientific consensus with respect to such areas;
- Major data gaps and whether gathering additional data would add significantly to overall confidence in assessment results;
- Key science policy judgements or default assumptions used to bridge information gaps and the basis for these assumptions; and
- Any significant elements of quantitative uncertainty analysis embedded in the risk estimate.

1. Human Health Risk Assessment

AK Steel shall conduct a human health risk assessment that focuses on current and potential future risks to persons coming into contact with Contaminants or Contaminated media related to the Facility and/or Additional Areas, including risks from ingestion of contaminated organisms. The human health risk assessment shall use data from the Facility and Additional Areas to identify the Contaminants of Concern (COCs), provide an estimate of how and to what extent human receptors might be exposed to the COCs currently and in the future (e.g., based on fate and transport modeling and/or changes in land or groundwater use), and provide an assessment of the health effects associated with these COCs. The human health risk assessment shall:

- (i) Project the potential risk of health problems occurring if no cleanup action is taken at the Facility or Additional Areas (other than actions completed pursuant to Attachment 1, Section II, Paragraphs 2, 4, 5, 6, 7 and 8 of the Consent Decree);

- (ii) Identify all areas and/or media where risks exceed an excess lifetime cancer risk of $1E^{-6}$ and all areas and/or media with a hazard index of 1 or greater; and
- (iii) For each of the risk or hazard levels referred to in Subpart 6.B.1(ii) above, calculate Media Cleanup Standards for the COCs (carcinogenic and non-carcinogenic) by rearranging the risk assessment equations to derive media and chemical-specific Contaminant concentrations based upon the same expected or potential exposures identified and evaluated in the completed risk assessment.

At AK Steel's option, the human health risk assessment may also identify all areas and/or media where excess lifetime cancer risks exceed $1E^{-4}$ and $1E^{-5}$. In this case, the human health risk assessment shall also calculate alternate Media Cleanup Standards that reflect such risk levels for each COC. Media Cleanup Standards shall be calculated in the manner specified in Subpart 6.B.1(iii) above.

AK Steel shall describe the methods and procedures for conducting the human health risk assessment in the RFI Workplan(s). AK Steel shall conduct the human health risk assessment consistent with relevant guidance identified by U.S. EPA, including guidance listed in Attachment 4 to this Consent Decree.

In accordance with the schedules in approved Workplans for RFI activities, AK Steel shall submit for review and approval in accordance with Section IX of the Consent Decree Human Health Risk Assessment Report(s) which shall set forth the results of the human health risk assessment(s) for each HWMU, SWMU, AOC, spill area and other suspected source area not screened from further evaluation pursuant to the approved CCR or Subpart 5.F, above. The Human Health Risk Assessment Report(s) shall also include the information that U.S. EPA will need to evaluate AK Steel's recommendation of a preferred corrective measure alternative. (See Sections 6 and 9 of U.S. EPA's *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Documents* (EPA 540-R-98-031, July 1999) for the information that is needed). The Human Health Risk Assessment Report(s) may be submitted as a separate document from the RFI Report, although AK Steel must summarize the results and the conclusions of the human health risk assessment in the RFI Report. The Human Health Risk Assessment Report shall contain the following general elements:

- data collection and evaluation;
- exposure assessment;
- toxicity assessment; and
- risk characterization.

2. Ecological Risk Assessment

AK Steel shall conduct an ecological risk assessment in accordance with relevant guidance provided by U.S. EPA, including, guidance listed in Attachment 4 to the Consent Decree. The ecological risk assessment shall describe the data collection activities conducted and the information listed below. The ecological risk assessment shall evaluate both current and potential future risks to ecosystems (e.g., eventual transport of Contaminants to surface waters and other ecosystems).

In accordance with the schedules in approved Workplans for RFI activities, AK Steel shall submit for review and approval in accordance with Section IX of the Consent Decree, Ecological Risk Assessment Report(s) which shall set forth the results of the ecological risk assessment. The Ecological Risk Assessment Report shall also include the information that U.S. EPA will need to evaluate AK Steel's recommendation of a preferred corrective measure alternative. (See Sections 6 and 9 of U.S. EPA's *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Documents* (EPA 540-R-98-031, July 1999) for the information that is needed). The Ecological Risk Assessment Report may be submitted as a separate document from the RFI Report, although the results and the conclusions of the ecological risk assessment shall be summarized in the RFI Report. The Ecological Risk Assessment Report shall include a discussion of the following elements:

- Project Scoping, Planning and Study Objectives;
- Conceptual Site Model;
- Ecological Exposure Areas;
- Chemicals of Concern, Fate and Transport, Sources of Data and the Analytical Procedures Used;
- Potential Ecological Receptors;
- Assessment and Measurement Endpoints;
- Stressor-Response and Exposure Profiles; and
- Risks to Assessment Endpoints, including Risk Estimates and Adversity Evaluations.

The Ecological Risk Assessment shall be based upon and reflect consideration of:

- Chemical sampling in potentially exposed habitats and reference sites;
- Toxicity testing;
- Tissue analyses;
- Biological community assessment;
- Habitat assessment of aquatic and terrestrial habitats on or potentially affected by the Facility and Additional Areas; and
- Assessment of ecological impacts on receptors. Impacts should include those occurring at individual level (e.g., mortality, growth and reproductive impairments) and those occurring at higher levels of biological organization (i.e., at population, community, and ecosystem levels).

C. Corrective Measures Objectives

The RFI Report shall include Corrective Measures Objectives (CMOs) on a facility area-wide or unit-specific basis as appropriate, developed in a manner consistent with the approved RAAR. Each CMO shall specify 1) a Media Cleanup Standard (MCS) (an acceptable Contaminant concentration); 2) the affected media; 3) the associated exposure pathway(s) and receptor(s); and 4) a point of compliance (where MCSs should be achieved). MCSs based on risk assessment shall be calculated by rearranging the risk assessment equations to derive media and chemical-specific Contaminant concentrations based on acceptable risk and hazard goals and expected or potential exposures identified and evaluated in the completed risk assessments. MCSs may also be based on background concentrations if the background-based MCSs are greater than risk-based values. The RFI Report shall include CMOs that specify MCSs reflecting a cumulative excess lifetime cancer risk of $1E^{-6}$. At AK Steel's option, the RFI Report may also include alternate CMOs that specify MCSs reflecting cumulative excess lifetime cancer risks of $1E^{-4}$ and $1E^{-5}$. AK Steel shall not be required to identify any CMO or MCS for (i) sediments or surface water in Monroe Ditch, Reach 1 or Reach 2 of Dicks Creek or the Outfall 002 channel, unless there is reason to believe that Contaminants have been released in or into such areas from the Facility or Additional Areas after the excavation and removal of Contaminated sediments from such areas pursuant to Attachment 1, Section II, Paragraphs 6 or 7; (ii) PCB contamination in Floodplain areas investigated pursuant to the approved Floodplain Soil Sampling and Analysis Plan, unless there is reason to believe that PCBs have been released in or into this area from the Facility or Additional Areas after collection of the samples required pursuant to the approved Floodplain Soil Sampling and Analysis Plan; or (iii) PCB contamination in areas described in

Attachment 1, Section II, Paragraphs 4.A and 5 that are investigated pursuant to the Upland Sources Sampling and Analysis Plan, unless there is a reason to believe that there has been a release of PCBs into such areas from the Facility of Additional Areas after collection of the samples required in such areas pursuant to the Upland Sources Sampling and Analysis Plan.

The CMOs shall support the development of corrective measures alternatives for evaluation in the CMS and ultimately the evaluation and recommendation by AK Steel of proposed corrective measures. AK Steel shall include in the RFI Report all information relied upon in developing the CMOs.

Part 7: Alternatives Summary Reports and Corrective Measures Studies

Purpose

The purpose of the Alternatives Summary Reports and the Corrective Measures Studies (CMS) portion of the RCRA corrective action process is to identify and evaluate potential corrective measures alternatives which address each of the CMOs identified in the approved RFI Reports.

As a first step, AK Steel shall submit for review and approval in accordance with Section IX of the Consent Decree an Alternatives Summary Report (ASR) for each CMS phase or component identified in the approved PMP. AK Steel shall submit the ASRs in accordance with the schedule in Part 9 of this SOW. The ASR for each CMS phase or component identified in the approved PMP shall include the following elements:

A. Introduction/Purpose

The ASR shall describe the purpose of the CMS and provide a summary description of the project.

B. Description of Current Conditions

The ASR shall include a summary/discussion of any new information that has resulted from the conduct of the RFI. This discussion shall identify and should concentrate on those issues which could significantly affect the evaluation and selection of the corrective measures alternative(s).

C. Corrective Measures Objectives

The ASR shall identify each of the CMOs in the approved RFI Report. AK Steel shall refer to each of the CMOs during the identification, screening, and development of Corrective Measures Alternatives described in Subpart 7.D, below.

D. Identification, Screening, and Development of Corrective Measure Alternatives

1. Identification: The ASR shall revise the list of potential remedial technologies identified in the approved CCR based on the results of the RFI as necessary to ensure that the identified potential remedial technologies address each CMO in the approved RFI Report. AK Steel shall describe each potential remedial technology and specify the areas and/or volumes of contaminated media the potential technology will address. A table shall be included that summarizes the available remedial technologies, the scope of their application, and the related CMOs identified in the approved RFI Report. Depending on the site-specific situation, EPA, after consultation with OEPA and Intervenors, may require AK Steel to consider additional remedial technologies.

AK Steel shall consider innovative treatment technologies, especially in situations where there are a limited number of applicable remedial technologies. Innovative technologies are defined as those technologies utilized for remediation other than incineration, solidification/waste stabilization, and pumping with conventional treatment for contaminated groundwater. Innovative treatment technologies may require extra effort to gather information, to analyze options, and to adapt the technology to the site-specific situation. Treatability studies and on-site pilot scale studies may be necessary for evaluating innovative treatment technologies.

2. Technology Screening: For each remedial technology identified pursuant to Subpart 7.D.1 of this SOW, the ASR shall include a screening evaluation based on effectiveness, implementability, and cost as those criteria are defined in Section 4.2.5 of EPA's "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA," EPA/540/G-89/004, OSWER Directive 9355.3-01, October 1988 (RI/FS Guidance). The evaluation shall focus on effectiveness at this stage with less emphasis on implementability and cost. Relative cost may be considered as a screening criterion only when comparing different remedial technologies that offer an equivalent level of protectiveness with respect to cumulative excess lifetime cancer risk (e.g., several different technologies that achieve $1E^{-6}$). The screening evaluation shall reflect consideration of Contaminant and site-specific considerations.

3. Corrective Measure Alternative Development: The ASR shall assemble the remedial technologies that survive the screening step into corrective measures alternatives, each of which comprehensively addresses the CMOs identified in the approved RFI Report and the applicable requirements of federal and state laws and regulations. The ASR shall develop a range of corrective measures alternatives, including combinations of treatment and containment technologies that address the Facility and Additional Areas (or subset thereof as identified in the approved PMP) as a whole. Each alternative shall be described with respect to the locations and areas affected, approximate volumes of media to be removed or treated, and any other information needed to adequately describe the alternative and document the logic behind the assembly of remedial technologies into specific corrective measures alternatives. For

groundwater, AK Steel shall develop corrective measures alternatives in a manner consistent with EPA's "Handbook of Groundwater Protection and Cleanup Policies for RCRA Corrective Action," EPA/530/R-01/015, April 2004.

4. Alternatives Screening Evaluation: As part of the ASR, AK Steel may perform, or EPA may require, that the assembled corrective measures alternatives undergo a screening process based on short- and long-term aspects of effectiveness, implementability, and relative cost as those criteria are defined in Section 4.3 of the RI/FS Guidance. The screening of alternatives is generally performed when there are many feasible alternatives available for detailed analysis. If necessary, the screening shall be conducted to assure that only those alternatives with the most favorable composite evaluation of all factors are retained for further analysis, while at the same time preserving an appropriate range of corrective measures options. Prior to conducting a screening of alternatives, AK Steel shall further define the alternatives such that aspects of the alternative such as sizing requirements for technologies, remediation time frames, interactions among media, and site-wide protectiveness (ability of the alternative to satisfy all of the CMOs) are described sufficiently to ensure that a basis exists for evaluating and comparing the alternatives (Section 4.3.1 of the RI/FS Guidance). To the extent that the RFI Report includes CMOs and MCSs that reflect varying levels of cumulative excess lifetime cancer risk, relative cost may be considered as a screening criterion only when screening different corrective measure alternatives that offer an equivalent level of protectiveness with respect to cumulative excess lifetime cancer risk.

The screening shall preserve the range of treatment and containment alternatives that was initially developed. The range of remaining alternatives shall include options that use treatment technologies and permanent solutions to the maximum extent practicable, and minimize inter-media transfer of contaminants. The chemical and physical characterization of the Facility and Additional Areas shall also be considered by identifying relationships between source areas with ongoing Contaminant releases and the media affected by the release. Where interactions among media appear to be important, the effect of source control actions on MCSs and/or time frames for other media should be evaluated.

5. Post-screening Considerations: At the conclusion of the alternative screening phase, or if no screening is needed, AK Steel shall determine if the amount and type of data existing (as provided in Section 4.3.3.3 of the RI/FS Guidance) for the Facility and Additional Areas will support the analysis of each corrective measures alternative that survived the screening step described in Subpart 7.D.4. Specifically, AK Steel shall consider whether any additional field investigation or treatability testing is necessary prior to proceeding with the analysis of the alternatives. If AK Steel determines that additional site data or treatability testing is needed, AK Steel shall document that determination, identify the specific types of data needed, and specify the time frame for obtaining the data in the ASR. If EPA concurs with AK Steel's determinations, AK Steel shall submit for review and approval in accordance with Section IX of

the Consent Decree such workplans or treatability study plans as needed to obtain the additional data. Should EPA determine, based on review of the ASR, that additional data is needed in order to perform the analysis of corrective measures alternatives, EPA, following consultation with OEPA and Intervenors, shall notify AK Steel of the need for and types of additional data needed. AK Steel shall submit for review and approval in accordance with Section IX of the Consent Decree such workplans or treatability study plans as needed to obtain the additional data.

The ASR shall include all of the information required pursuant to Subparts 7.A through 7.D above. The ASR shall also identify the federal and state laws and regulations applicable to each alternative, and shall document the methods, rationale, and results of the technology and alternatives development and screening process. The alternatives shall be modified by AK Steel if required by EPA's comments, to assure identification of an appropriate range of viable alternatives for consideration in the corrective measures alternatives evaluation. The ASR, as modified by EPA's comments, if any, shall be combined with the evaluation of corrective measures alternatives and recommendation of a preferred corrective measure described in Subparts 7.E and 7.F below to form the Corrective Measures Study Report. The ASR shall be submitted in accordance with the schedule in Part 9 of this SOW.

E. Evaluation of Corrective Measures Alternatives

Once it has been determined that sufficient data exist to proceed, AK Steel shall conduct an evaluation of each corrective measures alternatives that survived the screening step in Subpart 7.D.4 to provide EPA with the information needed to evaluate AK Steel's recommendation of a preferred corrective measures alternative. The evaluation shall consist of an evaluation of each alternative against each of the five evaluation criteria and a comparative analysis of all alternatives using the same evaluation criteria as a basis for comparison. At the conclusion of the evaluation, AK Steel shall submit for review and approval in accordance with Section IX of the Consent Decree a draft and final CMS Report. AK Steel shall submit the draft and final CMS Report in accordance with the schedule in Part 9 of this SOW. The CMS Report shall include the following elements.

For each corrective measures alternative that survived the screening step in Subpart 7.D.4, the CMS Report shall provide detailed documentation of how the major technical components of corrective measures, including cleanup of releases, source control and management of wastes that are generated by corrective action activities, will satisfy each of the criteria listed and discussed below:

1. Protect Human Health and the Environment;
2. Achieve Corrective Measures Objectives;

3. Control the source of releases of Contaminants so as to reduce or eliminate, to the extent practicable, further releases of Contaminants that may pose a threat to human health and the environment;
4. Comply with any applicable federal and state laws and regulations for management of wastes; and
5. Other Factors, as provided in Subpart 7.E.5 below.

Each of these criteria is discussed in more detail below.

1. Protect Human Health and the Environment

Corrective measures alternatives must be protective of human health and the environment. The CMS Report shall describe how each alternative achieves protection of human health and the environment, including an estimate of the time frame needed to achieve protection.

2. Achieve Corrective Measures Objectives

Corrective measures alternatives will be required to achieve the CMOs identified in the approved ASR. The CMS Report shall address whether the potential corrective measures alternatives will achieve each of the approved CMOs. The CMS Report shall also include an estimate of the time frame necessary for each alternative to meet the CMOs.

3. Control the Sources of Releases

A critical objective of any corrective measures alternative must be to minimize further environmental degradation by controlling or eliminating further releases that may pose a threat to human health and the environment. Unless source control measures are taken, efforts to clean up releases may be ineffective or, at best, will essentially involve a perpetual cleanup. Therefore, an effective source control program is essential to ensure the long-term effectiveness and protectiveness of the corrective measures alternatives.

As part of the CMS Report, AK Steel shall address the issue of whether sources of Contaminant releases are controlled. AK Steel shall include in the CMS Report a discussion on how well the source control methods are anticipated to work given the particular situation at the Facility and/or Additional Areas and the known track record of the specific technology.

4. Comply With Any Applicable Federal and State Laws and Regulations for Management of Wastes.

The CMS Report shall include a discussion of how the specific waste management activities will be conducted in compliance with all applicable State or Federal laws and regulations (e.g., closure requirements, land disposal restrictions).

5. Other Factors

There are five general factors that will be considered as appropriate by EPA in selecting/approving a corrective measures alternative that meets the four standards listed above. These factors represent a combination of technical measures and management controls for addressing the environmental problems at the Facility and Additional Areas. The five general decision factors include:

- a. Long-term reliability and effectiveness;
- b. Reduction in the toxicity, mobility or volume of wastes;
- c. Short-term effectiveness;
- d. Implementability; and
- e. Cost.

AK Steel shall evaluate each corrective measures alternative against the factors listed below and provide all information supporting the use of these factors in the evaluation.

a. Long-term Reliability and Effectiveness

Demonstrated and expected reliability is a way of assessing the risk and effect of failure. AK Steel shall consider whether the technology or combination of technologies have been used effectively under analogous site conditions, whether failure of any one technology in the alternative would have an immediate impact on receptors, and whether the alternative would have the flexibility to deal with uncontrollable changes at the Facility and/or Additional Areas (e.g., heavy rain storms, flooding, earthquakes, etc.).

AK Steel shall also evaluate each corrective measure alternative in terms of the projected useful life of the overall alternative and of its component technologies. Useful life is defined as the length of time the level of effectiveness can be maintained.

b. Reduction in the Toxicity, Mobility or Volume of Contaminants

AK Steel shall evaluate the extent to which each alternative employs treatment technologies that are capable of eliminating or substantially reducing the inherent potential for the Contaminants in HWMUs, SWMUs, AOCs, spill areas, and other suspected source areas (and/or Contaminated media at the Facility and or Additional Areas) to cause future environmental releases or other risks to human health and the environment. AK Steel shall identify any situations where achieving substantial reductions in toxicity, mobility or volume may not be practical, such as large, municipal-type landfills, or Contaminants that would be extremely dangerous to handle and for which the short-term risks of treatment outweigh potential long-term benefits.

AK Steel shall estimate how much each corrective measures alternative will reduce the toxicity, mobility, and volume of the Contaminants. This may be done through a comparison of initial site conditions to expected post-corrective measure implementation conditions.

c. Short-term Effectiveness

Short-term effectiveness may be particularly relevant when remedial activities will be conducted in densely populated areas, or where Contaminant characteristics are such that risks to workers or to the environment are high and special protective measures are needed. Factors to consider include fire, explosion, exposure to hazardous substances and potential threats associated with treatment, excavation, transportation, and re-disposal or containment of Contaminants.

d. Implementability

AK Steel shall identify alternatives or components of alternatives that will require State or local approvals prior to construction, which may increase the time necessary to implement the remedy. In some cases, State or local restrictions or concerns may necessitate eliminating or deferring certain technologies or remedial approaches from consideration in remedy selection. Information to consider when assessing implementability may include:

1. The administrative activities needed to implement the corrective measure alternative (e.g., permits, rights of way, off-site approvals, etc.) and the length of time these activities will take;
2. The constructability, time for implementation, and time for achieving CMOs;

3. The availability of adequate off-site treatment, storage capacity, disposal services, needed technical services and materials; and
4. The availability of prospective technologies for each corrective measure alternative.

e. Cost

The relative cost of an alternative may be considered in those situations where several different technical alternatives offer equivalent protection of human health and the environment but vary widely in cost. However, in those situations where only one remedy is being proposed, the issue of cost does not need to be considered. AK Steel shall provide cost information including costs for: engineering, site preparation, construction, materials, labor, sampling/analysis, waste management/disposal, permitting, health and safety measures, training, operation and maintenance, etc.

F. Recommendation by AK Steel of a Corrective Measure Alternative

In each CMS Report submitted pursuant to this SOW, AK Steel shall recommend a preferred corrective measures alternative for consideration by EPA, OEPA and Intervenor. Such a recommendation shall include a description, supporting rationale, and all information needed to determine if the alternative is consistent with the criteria and decision factors discussed in Subpart 7.E above and with EPA's "Rules of Thumb for Superfund Remedy Selection," EPA 540-R-97-013, OSWER Directive 9355.0-69, PB97-963301, August 1997.

G. Public Participation

Prior to approval of any CMS Report, EPA may, following consultation with OEPA and Intervenor, issue a proposed decision regarding selection of corrective measures for the Facility and Additional Areas, and provide a Statement of Basis for such proposed decision. EPA may propose to select corrective measures other than the corrective measure alternative recommended by AK Steel in the CMS Report. EPA may provide an opportunity for submission of public comments, an opportunity for a public meeting and other public involvement activities, as well as providing a response to any public comments on the proposed corrective measures, prior to issuing its final decision regarding selection of corrective measures for the Facility and Additional Areas. Changes to the proposed corrective measures for the Facility and Additional Areas may be made after consideration of public comment. If EPA determines, based on public comment or otherwise, that the CMS Report does not provide information necessary to support its proposed corrective measures or any modifications to the final corrective measures in light of public comments, EPA, following consultation with OEPA and Intervenor, may require AK Steel to perform additional studies and revise the CMS Report to incorporate the information

developed during such studies. EPA's approval of the revised CMS Report shall not constitute or be construed as adoption of the recommendation in the CMS Report regarding a preferred corrective action alternative.

Part 8: Progress Reporting

Upon request by EPA, following consultation with OEPA and Intervenors, AK Steel shall participate in periodic (no more than monthly) conference calls with EPA, OEPA, and Intervenors, to discuss the progress of the RFI and CMS, including data and other findings as they are generated. AK Steel shall also submit to EPA, OEPA and Intervenors signed monthly progress reports, which shall include the following information:

1. A description of activities performed and estimate of the percentage of the RFI/CMS completed;
2. Summaries of all findings in the reporting period, including results of any sampling and analysis, pilot studies, or other studies;
3. Summaries of any deviations from approved workplans for the RFI/CMS during the reporting period and the reasons for such deviations;
4. Summaries of all formal contacts with representatives of the local community, public interest groups or State government other than OEPA during the reporting period;
5. Summaries of all contacts made regarding access to off-site property;
6. Summaries of all problems encountered during the reporting period;
7. Actions being taken to rectify problems;
8. Changes in relevant personnel during the reporting period; and
9. Projected work for the next reporting period.

AK Steel shall maintain in its records and provide upon request or make available for inspection, copies of laboratory/monitoring data, inspection reports, and contractor reports or other documents providing a description of work performed for AK Steel as part of the RFI/CMS, etc.

Part 9: Schedule

AK Steel shall implement the RFI/CMS in accordance with the following schedule:

Facility Submission	Due Date
Submit Current Conditions Report	120 days after entry of the Consent Decree, unless EPA approves a longer period after consultation with OEPA and Intervenors
Submit Project Management Plan	180 days after entry of the Consent Decree, unless EPA approves a longer period after consultation with OEPA and Intervenors
Submit RFI/CMS Workplan relating to the OMS area landfills (SWMUs 38 and 39)	180 days after entry of the Consent Decree, unless EPA approves a longer period after consultation with OEPA and Intervenors
Submit RFI Workplan relating to past releases of coke oven gas and benzene from the melt area	In accordance with the schedule in the approved PMP, unless EPA approves a longer period after consultation with OEPA and Intervenors
Submit RFI Workplan relating to any other high priority areas identified in Part 2 of this SOW	In accordance with the schedule in the approved PMP, unless EPA approves a longer period after consultation with OEPA and Intervenors
Submit Facility-wide groundwater CMS (excluding groundwater from the OMS landfill areas) (SWMUs 38 and 39)	In accordance with the schedule in the approved PMP, unless EPA approves a longer period after consultation with OEPA and Intervenors
Submit RFI Workplan(s) for any other areas of the Facility and Additional Areas	In accordance with the schedule in the approved PMP, unless EPA approves a longer period after consultation with OEPA and Intervenors
Submit Health and Safety Plan	90 days after entry of the Consent Decree, unless EPA approves a longer period after consultation with OEPA and Intervenors

Facility Submission	Due Date
Implement RFI investigations for each RFI phase or component identified in the approved PMP	In accordance with schedule in approved RFI Workplan or RFI/CMS Workplan, as applicable, for the respective RFI phase or component, unless EPA approves a longer period after consultation with OEPA and Intervenor
Submit RAAR for each RFI phase or component identified in the approved PMP	In accordance with the schedule in the approved RFI Workplan or RFI/CMS Workplan, as applicable, for the respective RFI phase or component, unless EPA approves a longer period after consultation with OEPA and Intervenor
Submit RFI Report for each RFI phase or component identified in the approved PMP	In accordance with the schedule in the approved RFI Workplan or RFI/CMS Workplan, as applicable, for the respective RFI phase or component, unless EPA approves a longer period after consultation with OEPA and Intervenor
Submit each CMS Workplan required pursuant to any approved RFI Report	Within 30 days after approval of the RFI Report, unless EPA approves a longer period after consultation with OEPA and Intervenor
Submit ASR for each identified CMS phase or component for which a CMS is required pursuant to this SOW	Within 30 days of EPA's approval of the CMS Workplan, unless EPA approves a longer period, after consultation with OEPA and Intervenor
Submit CMS Report for each identified CMS phase or component for which a CMS is required pursuant to this SOW	Within 60 days of EPA approval of the ASR for the respective CMS phase or component, unless EPA approves a longer period, after consultation with OEPA and Intervenor

Facility Submission	Due Date
For each identified CMS phase or component for which a CMS is required pursuant to this SOW, submit final revisions to CMS Report, if required after Public Involvement Process in Subpart 7.F	45 days after receipt of notification that revisions are required, unless EPA approves a longer period, after consultation with OEPA and Intervenors
Submit Progress Reports	Monthly, by the 15th of each Month, beginning on the first month after entry of the Consent Decree